MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY

STREAM REACH ASSESSMENT FIELD FORM

Instructions: This assessment is meant to be relatively quick, so it is necessarily subjective. As a general rule of thumb a surveyor should be able to complete approximately 20 stream miles per day. This procedure should only be applied to second, third, and fourth order drainages. Each stream will consist of one or more reaches. If more than one reach is assessed, one form will be completed for each reach.

Reaches will be defined by the surveyor and based on relatively homogenous conditions throughout. As a general rule, reach breaks occur where obvious changes in stream condition are detected. The surveyor should be aware of changes such as land use, flow, gradient, vegetation, valley form, and channel substrate. Reach length should generally range between .5 and 20 miles. If the entire reach is not walked the surveyor should select fairly accessible observation points that adequately represent the range of conditions for the reach. Desirable observation points may include the downstream end of the reach, above and below human activities or tributaries.

The surveyor should walk approximately 300' channel distance at each observation point or enough distance to get a representative picture of the situation at that point. If possible, try and observe at least one pool, riffle, and run feature at each site. If a stream crossing structure is present try to observe channel conditions above and below the area influenced by the structure. Dry channels will obviously preclude or restrict the ability to rate parameters such as "turbidity", "water odor", "water surface oils" and "aquatic plant growth"; however, in many cases water is present in isolated pools and the surveyor can rate these parameters. "Riffle/pool spacing" and "Riffle/pool characteristics" ratings may be difficult in dry streams, but evidence in the channel should allow the surveyor to evaluate these parameters.

Again, one legible form should be completed for each reach, with ratings based on a compilation of average conditions for all observation points within the reach. Photos/slides depicting average reach conditions and notable features should be taken if possible. A legible stream map of sufficient scale and detail to identify reaches, observation/photo points, and any unique features should be completed and attached to the assessment forms.

Note: In most cases the information from the assessment forms will be evaluated in the office and entered into a central database by someone other than the field surveyor; therefore, it is extremely important that all recorded information is complete and legible.

RIVER BASIN MAP (for identifying name of river basin recorded on page 2)

STREAM REACH ASSESSMENT FORM

River Basin Name (see map on p.1)_____Stream Name _____
Recorders Name_____ **Date**__/__/__**County/ies**_____ **Reach Number** (assigned by surveyor, number consecutively starting @ mouth) _____ **Legal Description** [Sec., Town., Range]- **(Downstream end)** _____**(Upstream end)**_____ **Narrative Description Of Reach**_____
Quad Sheet Name(s) - optional _____Photo/Slide # 's if applicable _____ _____ _____**LOOK!---**Answer all the following questions. If you are unable to determine record **(N/R),** or if a parameter is not applicable **(N/A).**

(Please check the one description that best fits each category)
Predominant vegetation and landscape characteristics in the watershed beyond the immediate riparian zone
_____-Perennial vegetation (pasture, rangeland, woodland, etc.), flat to rolling landscape
_____-Perennial vegetation, rolling to steep landscape
_____-Mixed perennial vegetation and annual crops, flat to rolling landscape
_____-Cropland, rolling to steep landscape

Meanders
_____-Slight Meandering - Relatively straight channel with only occasional curves. Travel length is basically the same as the straight line distance.
_____-Moderate meandering - Easy, gradual bends in the channel path
_____-Extreme meandering - Travel length of flow is greater than twice the straight line distance

Flood Flow Width
_____-Floods are confined in narrow canyon with width less that twice that of channel
_____-Floods confined to a flow width of 2-3 times the width of the channel
_____-Floods are unconfined and spill out onto flat valley bottom

Gradient
_____-Steep - Continuous rapids
_____-Moderate - Alternating rapids, riffles and smooth surfaced reaches
_____-Gradual - Smooth surfaced reaches with occasional riffles
_____-Flat - Very rare disruptions in smooth flat surface of stream
_____(Please enter a number within the range of the category that best fits)

1.Average width of riparian zone
16-20_____ - (> 90 ft wide)
11-15_____ -Varies from 15 to 90 ft
6-10 _____ - (3-15 ft)
1-5 _____ -Riparian zone absent

2.Completeness of vegetation in the riparian zone
(Any vegetation functioning to maintain the bank)
16-20_____ -Riparian zone intact without breaks in vegetation
11-15_____ -Breaks occurring intermittently
6-10 _____ -Breaks frequent with some gullies and scars every 100 - 150 ft.
1-5 _____ -Deeply scarred with active headcutting and gully formation all along reach

Is there evidence of sediment from the upper watershed or riparian area reaching the stream channel?
Yes_____No_____If yes, please describe: _____

3. Characteristics of the Riparian vegetation
16-20_____ -Diversity of perennial plant species reflects potential for site; Dense growth (hard to walk through); good plant vigor and age diversity
11 -15_____ -Approximately 60% of climax plant species present; p lant vigor stable, density of growth mostly open (easy to walk through)
6-10 _____ -Little diversity in perennial plant species, and/or age of trees; plants scattered; vigor poor

1-5 _____ -Site is dominated by annual forbs and weeds; few perennial or climax plants present

4. Width/Depth Ratio (<u>Estimated</u> channel width divided by depth as measured at the ordinary high water level). This is the point where high flow <u>normally</u> reaches on the bank and is most easily determined on straight channel sections where the "scoured" channel meets the "permanent" vegetation. Look for characteristics such as terracing, soil changes (rock to soil), presence/absence of vegetation or debris.

10-12 _____ -Width/depth ratio <8
7-9 _____ -Width/d epth ratio 8 to 15
4-6 _____ -Width/depth ratio 15 to 25
1-3 _____ -Width/depth ratio > 25 <u>or</u> stream is channelized <u>or</u> channel is an incised gully.

5.Channel stability/bar formation

10-12 _____ -Little or no channel instability resul ting from sediment accumulation
7-9 _____ -Some gravel bars of coarse stones and well-washed debris present, little silt
4-6 _____ -Point bars enlarging by gravels, sand and/or silt, new bars forming
1-3 _____ -Channel divided into braids or stream is channelized

6.Bank erosion

16-20 _____ -Little or none evident, banks appear stable and are held firmly by vegetation
11-15 _____ -Erosion occurring on some outside bends and channel constrictions; non-eroding banks stabl e
6-10 _____ -Erosion common on most outside bends and channel constrictions
1-5 _____ -Erosion predominant on entire channel (straight sections, inside and outside bends, etc.)

(Answer **ONE,** either 7a. **<u>OR</u>** 7b.)

7a. Stream bottom - (For Fast moving/Riffle dominated streams)

16-20 _____ -Stony bottom of several sizes packed together, interstices obvious
11-15 _____ -Stony bottom easily moved, with little silt
6-10 _____ -Bottom of silt, gravel and sand, stable in places
1-5 _____ -Uniform bottom of sand and silt loosely held together, stony substrate absent

7b. Stream bottom - (For Slow moving/Pool dominated streams)

16-20 _____ -Mixture of substrate materials with gravel and firm sand prevalent; vascular root mats and submerge vegetation common
11-15 _____ -Mixture of soft sand, mud or clay; mud may be dominant; some vascular root mats and submerge vegetation present
6-10 _____ -All mud or clay, or channelized with sand bottom; little or no submerged vegetation
1-5 _____ -Hardpan clay or bedrock; no vascular root mat or submerged vegetation

(Answer **ONE,** either 8a. **<u>OR</u>** 8b.)

8a. Riffle/pool spacing - (For Fast moving/Riffle dominated streams)

16-20 _____ -Distinct, occurring at inter vals of 5-7x stream width
11-15 _____ -Irregularly spaced, 8-15x stream width
6-10 _____ -Long pools separating short riffles, meanders absent, 16-25x stream width
1-5 _____ -Meanders and riffles/pools absent or stream channelized, >25x stream width

8b. Riffle/pool characteristics - (For Slow moving/Pool dominated streams)

16-20 _____ -Even mix of deep, shallow, large and small pools
11-15 _____ -Majority of pools large and deep, very few shallow pools
6-10 _____ -Shallow pools more prevalent than deep pools
1-5 _____ -Majority of pools small and shallow or pools absent

9.Aquatic plant growth

10-12 _____ -Not apparent, but rocks or other submerged objects feel slippery
7-9 _____ -In small patch es or along channel edges
4-6 _____ -In large patches or discontinuous mats
1-3 _____ -Mats cover bottom (hyper-enriched conditions) or plants not apparent and rocks not slippery (stream

devoid of algae because of toxic conditions)

10.Turbidity

10-12 _____ -Clear
7-9 _____ -Slightly off Color
4-6 _____ -Opaquem (can see through)
1-3 _____ -Cloudy (can't see through)
Color: _____ is rain or runoff influencing turbidity levels today? Yes_____ No_____

STREAM NAME : _____, REACH NUMBER: _____, DATE __/__/__

11.Water surface oils

10-12 _____ -None
7-9 _____ -Slight
4-6 _____ -Moderate
1-3 _____ -Severe
Slick_____ Sheen_____ Flecks_____ Other_____

12.Materials other than sediment on channel bottom (examples: iron or aluminum oxides, calcium carbonate)

10-12 _____ -None
7-9 _____ -Slight
4-6 _____ -Modera te
1-3 _____ -Severe
State color _____

13.Salinization

10-12 _____ -None Evident
7-9 _____ -Evidence of salinity is present in the watershed, but no salt cru sts observed in or near the stream
4-6 _____ -Minor evidence of salts in or near the stream. Plant diversity may be reduced or dominated by salt tolerant species.
1-3 _____ -Salt crusts common in or near the stream or on stream banks. Vegetation may be severely reduced due to salt.

14.Water Odor

10-12 _____ -None
7-9 _____ -Slight
4-6 _____ -Moderate
1-3 _____ -Strong
Describe Odor - Sewage_____ Petroleum _____ Chemical ____ Natural ____ Other ____

15.Dewatering - From irrigation or natural factors such as subsurface flows. (Assess during critical low flow periods, or you may need to inquire locally about this.)

10-12 _____ -No Apparent water loss (irrigation return flow may be supplementin g base flow)
7-9 _____ -Water loss noticeable, however flows are adequate to support aquatic organisms
4-6 _____ -Flow supports aquatic organisms, but habitat, especially riffles, is drastically reduced
1-3 _____ -Channel may be dry or flow low enough to preclude or severely impair aquatic organisms
Are irrigation diversion or return structures present? Yes_____ No_____

16.Amount of fish cover (Relative % of reach with some type of fish cover)

10-12 _____ -Extens ive (> 50%)
7-9 _____ -Moderate (25-50%)
4-6 _____ -Sparse (< 25%)
1-3 _____ -Absent or "choking" vegetation only
Fish cover type -mark all that apply with (**P**)= present, (**C**)=comm on, (**A**)= abundant .

Undercut banks_____ Overhanging vegetation _____ Deep Pools _____ Logs/Woody Debris _____ Boulders _____
Rootwads _____ Aquatic Vegetation _____ Other ____
Total _____ - by Total Possible (rated parameters only) _____ X 100 = _____ %

(Please check one category below)

IMPAIRMENT/USE SUPPORT VALUES

_____87-100% = NON-IMPAIRED; (FULL SUPPORT)

_____80 - 86% = NON-IMPAIRED; BUT THREATENED; (FULL SUPPORT)

_____71 - 79% = MINOR IMPAIRMENT; (PARTIAL SUPPORT)

_____55 - 70% = MODERATE IMPAIRMENT; (PARTIAL SUPPORT)

_____0 - 54% = SEVERE IMPAIRMENT; (NON-SUPPORT)

TOTAL MAXIMUM COMPARED TO REFERENCE STREAM:

Note: Data should be compared to reference condition.

Total Value: _____

Reference Stream Value: _____

(Enter Value of reference stream in order to compare >75%=Fully supporting results from stream being assessed.)

50-75%=Partially supporting <50%=Non-supporting.

Total Value/Reference Stream Value: _____

Impacts to **S**oil, **W**ater, **A**ir, **P**lants, **A**nimals, **C**ultural

Suspected impacts to S.W.A.P.A.C., by land uses in the watershed. Indicate suspected degree of impact (**H**igh, **M**oderate, **L**ow) for each land use. Please elaborate in the comment section.

Check each land use that is present, **and** also those resource assumed to be affected by that land use.

LAND USE	SOIL	WATER	AIR	PLANTS	ANIMALS	CULTURAL
Dryland Crop						
Irrigated Crop						
Grazing						
Feedlots						
Mining-Surface						
Mining-Subsurface						
Timber Harvest						
Urban						
Roads						
Other ( )						
Natural						

Comments: (reference to land use and S.W.A.P.A.C. category) _____

_____

_____

_____

_____

Brief Description of Reach : _____

(revised 4/95)